IN THE CLAIMS:

1. (Original) An optical transmission system in which an optical signal is transmitted from an optical transmitter to an optical receiver and outputted in a form of an output electrical signal after a noise canceling process is performed, the noise canceling process canceling out noise components which occur during the transmission, wherein

the optical receiver and the optical transmitter are connected to each other by one optical fiber, through which an optical signal is transmitted before being intensity-modulated,

the optical receiver includes:

a first processing unit operable to receive an optical signal, intensity-modulate the received optical signal, and split the intensity-modulated optical signal into two optical signals of which respective intensity-modulated components are in antiphase;

first and second optical transmission fibers which transmit the two optical signals respectively; and

a second processing unit operable to convert the two optical signals into electrical signals respectively, and generate an output electrical signal by performing differential amplification on the electrical signals.

2. (Original) The optical transmission system of Claim 1, wherein

the optical transmitter includes an output processing unit operable to receive an electrical signal, convert the electrical signal into an optical signal, and transmit the optical signal to the optical receiver via the optical fiber.

3. (Original) The optical transmission system of Claim 2, wherein

the first processing unit includes:

an intensity modulation subunit operable to receive an optical signal via the optical fiber, intensity-modulate the received optical signal based on a modulated electrical signal having a certain frequency, and thereby generate a modulated optical signal; and

an optical separation subunit operable to generate, from the modulated optical signal, a first output optical signal and a second output optical signal of which respective intensity-modulated components are in antiphase, and output the first and second output optical signals to the first and second optical fibers respectively, and

the second processing unit includes:

an optical/electrical conversion subunit operable to convert the first and second output optical signals into first and second electrical signals respectively; and

a differential amplification subunit operable to invert a phase of the second electrical signal, add the phase-inverted second electrical signal to the first electrical signal, and thereby generate the output electrical signal.

4. (Original) The optical transmission system of Claim 3, wherein

the first processing unit consists of a Mach-Zehnder type external modulator, and

the second processing unit consists of a balanced optical/electrical converter.

5. (Original) The optical transmission system of Claim 3, wherein

the electrical signal which the output processing unit receives is an intermediate frequency signal having a frequency which is different from a frequency of a radio frequency signal,

the modulated electrical signal is a local oscillator signal,

the intensity modulation subunit intensity-modulates the received optical signal based on a frequency of the local oscillator signal, and thereby generates the modulated optical signal of which intensity-modulated components have a frequency of the radio frequency signal,

the optical/electrical conversion subunit converts the first and second output optical signals into the first and second electrical signals respectively, the first and second electrical signals having the frequency of the radio frequency signal, and

the differential amplification subunit inverts the phase of the second electrical signal, adds the phase-inverted second electrical signal to the first electrical signal, and thereby generates the radio frequency signal.

6. (Original) The optical transmission system of Claim 2, wherein

the output processing unit includes:

a generation subunit operable to receive an electrical signal, convert the received electrical signal into an optical signal, and output the optical signal to a third optical transmission fiber; and

a polarization scrambler operable to receive the optical signal via the third optical transmission fiber, change a polarization type of the optical signal randomly, and output the optical signal to the optical receiver via the optical fiber.

7. (Original) The optical transmission system of Claim 6, wherein

the first processing unit receives an optical signal of which a polarization type changes randomly from the optical transmitter via the optical fiber.

8. - 12. (Cancelled)

13. (Previously Presented) An optical transmission method that is used for an optical transmission system in which an optical signal is transmitted from an optical transmitter to an optical receiver and outputted in a form of an output electrical signal after a noise canceling process is performed, the noise canceling process canceling out noise components which occur during the transmission, wherein

the optical receiver and the optical transmitter are connected to each other by one optical fiber, through which an optical signal is transmitted before being intensity-modulated,

the optical receiver performs:

a first processing step of receiving an optical signal, intensity-modulating the received optical signal, and splitting the intensity-modulated optical signal into two optical signals of which respective intensity-modulated components are in antiphase;

a transmission step of transmitting the two optical signals with use of first and second optical transmission fibers respectively; and

a second processing step of converting the two optical signals into electrical signals respectively, and generating an output electrical signal by performing differential amplification on the electrical signals.

14. (Previously Presented) The optical transmission method of Claim 13, wherein

the optical transmitter performs an output processing step of receiving an electrical signal, converting the electrical signal into an optical signal, and transmitting the optical signal to the optical receiver via the optical fiber.

15. (Previously Presented) The optical transmission method of Claim 14, wherein

the first processing step performs:

an intensity modulation step of receiving an optical signal via the optical fiber, intensity-modulating the received optical signal based on a modulated electrical signal having a certain frequency, and thereby generating a modulated optical signal; and

an optical separation step of generating, from the modulated optical signal, a first output optical signal and a second output optical signal of which respective intensity-modulated components are in antiphase, and outputting the first and second output optical signals to the first and second optical fibers respectively, and

the second processing step performs:

an optical/electrical conversion step of converting the first and second output optical signals into first and second electrical signals respectively; and

a differential amplification step of inverting a phase of the second electrical signal, adding the phase-inverted second electrical signal to the first electrical signal, and thereby generating the output electrical signal.

16. (Previously Presented) The optical transmission method of Claim 15, wherein

the first processing step is performed in a Mach-Zehnder type external modulator, and

the second processing step is performed in a balanced optical/electrical converter.

17. (Previously Presented) The optical transmission method of Claim 15, wherein

the electrical signal processed in the output processing step is an intermediate frequency signal having a frequency which is different from a frequency of a radio frequency signal,

the modulated electrical signal is a local oscillator signal,

the intensity modulation step intensity-modulates the received optical signal based on a frequency of the local oscillator signal, and thereby generates the modulated optical signal of which intensity-modulated components have a frequency of the radio frequency signal,

the optical/electrical conversion step converts the first and second output optical signals into the first and second electrical signals respectively, the first and second electrical signals having the frequency of the radio frequency signal, and

the differential amplification step inverts the phase of the second electrical signal, adds the phase-inverted second electrical signal to the first electrical signal, and thereby generates the radio frequency signal.

18. (Previously Presented) The optical transmission method of Claim 14, wherein

the output processing step performs:

a generation step of receiving an electrical signal, converting the received electrical signal into an optical signal, and outputting the optical signal to a third optical transmission fiber; and

a polarization scramble step of receiving the optical signal via the third optical transmission fiber, changing a polarization type of the optical signal randomly, and outputting the optical signal to the optical receiver via the optical fiber.

19. (Previously Presented) The optical transmission method of Claim 18, wherein

the first processing step receives an optical signal of which a polarization type changes randomly from the optical transmitter via the optical fiber.

20. - 24. (Cancelled)